CLAIMS

1. A laser transmitter comprising:

a housing having a first laser exit window and a second laser exit window;

a laser source in said housing, configured to emit a reference beam of light; and

a drive device, operatively configured to orient said laser source such that said reference beam exits said housing through a select one of said first and second laser exit windows as a collimated laser output beam.

2. The laser transmitter according to claim 1, wherein said first and second laser exit windows on said housing are oriented in substantially orthogonal planes.

3. The laser transmitter according to claim 1, wherein said drive leveling device can adjustably orient said reference beam across a range of at least 90 degrees.

4. The laser transmitter according to claim 1, wherein said drive leveling device can adjustably orient said reference beam across a range of at least 135 degrees.

5. The laser according to claim 1, wherein:

said first laser exit window is positioned on said housing so as to allow said pipe transmitter to be oriented in a generally horizontal position and direct said collimated beam in a generally horizontal direction at a select grade; and

said second laser exit window is positioned on said housing so as to allow said pipe transmitter to be oriented in a generally vertical position and direct said collimated beam in said generally horizontal direction at said directed grade.

6. The laser transmitter according to claim 1, wherein said drive leveling device comprises a motor operative to incrementally adjust said laser source to a level position in response to a signal derived from a level sensor.

7. The laser transmitter according to claim 6, wherein:

said motor comprises a stepper motor configured to provide a predetermined motor step and said drive leveling device further comprises:

a gear reducer coupled to said stepper motor;

a spur gear reducer coupled to said gear reducer configured to fine tune said predetermined motor step; and

gearing coupled to said spur gear.

8. The laser transmitter according to claim 7, further comprising a slip clutch configured to prevent impact loading transfer to said gearing.

9. The laser transmitter according to claim 6, wherein said drive leveling device is configured to fine tune level positioning in arcsecond level position resolution.

10. A laser assembly for a laser transmitter comprising:

a frame having first and second supporting members in spaced relation to one another;

a holder pivotably arranged between said first and second supporting members;

a laser source secured by said holder, said laser source configured to emit a reference beam of laser light;

a drive device operative to pivot said holder about said frame;

a level sensor operative to detect whether said laser source is in a level position or an out of level position with respect to a predefined plane; and

a controller configured to selectively operate said drive device to pivot said laser source towards said level position with respect to said frame based upon information from said level sensor.

11: The laser assembly according to claim 10, wherein said holder comprises a first leveling point pivotably secured to said first supporting member and a second leveling point pivotably

secured to said second supporting member.

12. The laser assembly according to claim 11, wherein said first pivot point is journaled for rotation in said first supporting member and said second pivot point is journaled for rotation in said second supporting member.

13. The laser assembly according to claim 12, wherein said first and second pivot points are aligned coaxially defining a leveling axis therebetween.

14. The laser assembly according to claim 13, wherein said reference beam passes through said a point defined along said leveling axis.

15. The laser assembly according to claim 10, wherein said laser source is adjustably repositionable about said holder to allow adjustment of laser focus.

16. The laser assembly according to claim 10, wherein said drive holder is capable of pivoting more than 80 degrees with respect to said frame;

17. The laser assembly according to claim 16, wherein said drive device comprises a motor.

18. The laser assembly according to claim 17, wherein:

said holder comprises a first leveling point pivotably secured to said first supporting member and a second leveling point pivotably secured to said second supporting member;

said motor is secured to said holder and includes a shaft that is coupled to said first leveling point such that rotation of a shaft of said motor causes a corresponding pivotal motion of said holder with respect to said frame.

19. The laser assembly according to claim 18, further comprising:

a first gear coupled to said shaft of said motor such that said first gear and said shaft

rotate with unitary rotation motion; and

a second gear fixedly secured about said first leveling point, said first and second gears meshed together such that rotation of said shaft of said motor causes unitary rotational motion of said first gear, which meshes with said second gear to pivot said holder about said first and second leveling points.

20. The laser assembly according to claim 17, wherein said motor comprises a stepper motor.

21. The laser assembly according to claim 17, further comprising a gear reducer coupled to said motor.

22. The laser assembly according to claim 10, further comprising a roll sensor coupled to said controller, said roll sensor configured to sense whether said laser has been rotatively misaligned along its centerline axis to a magnitude that would not allow said laser to meet predetermined accuracy requirements.

23. A laser system comprising:

a laser transmitter including:

a housing having a first laser exit window and a second laser exit window;

a laser source in said housing, configured to emit a reference laser beam;

a drive leveling device operatively configured to orient said laser source such that said reference beam exits said housing through a select one of said first and second laser exit windows as a collimated laser beam; and

a laser target configured to detect said collimated laser beam.

24. A laser transmitter comprising:

a housing having a first laser exit window and a second laser exit window;

a laser source in said housing, configured to emit a reference beam;

a leveling device configured to indicate when said reference beam is oriented in a

generally horizontal position; and

a drive device, operatively configured to orient said reference beam so as to exit said housing through a select one of said first and second laser exit windows as a collimated laser beam, said drive device arranged to orient said laser source in response to a signal from said leveling device.

25. A laser transmitter comprising:

a housing having a first laser exit window and a second laser exit window;

a laser source in said housing, configured to emit a reference beam; and

a drive device operatively configured to orient said reference beam so as to exit said housing through a select one of said first and second laser exit windows as a collimated laser beam oriented generally horizontally during a setup mode of operation, wherein during said set up mode of operation, a level sensor provides feedback as to the level of said laser source with respect to the horizontal.

26. The laser transmitter according to claim 25, wherein said output beam is programmable to a select grade and said output beam is oriented to said select grade after said set up mode of operation.